States flora on the basis of an old collection from Ford County. It has been found to be frequent on saline areas in Barber, Rice and Stafford Counties. A representative collection is: Common on saline plain, 1½ miles southeast of Hazelton, Barber County, July 28, 1959, *McGregor 14589*.

Mimosa borealis Gray. Known previously in Kansas only from Meade County it has now been located 85 miles east as follows: Gypsum Hills prairie, rocky hillside, five miles south and two miles east of Lake City, Barber County, June 24, 1959, *McGregor 14479*. Sixty-three of these shrubby plants were counted in the area.

Dalea compacta Spreng. From sand hill prairies, valley of Cimarron River, eight miles north of Elkhart, Morton County, July 9, 1958, *McGregor 13971*. Known previously only from Grant and Stevens counties. Some specimens from the Morton County colony had spikes 25 cm. long as compared with the usual descriptions of up to 15 cm. in length. — DEPT. OF BOTANY, UNIVERSITY OF KANSAS, LAWRENCE.

ELEOCHARIS ACICULARIS IN ACID MINE DRAINAGE

ELWOOD B. EHRLE

During a recent floristic study (Ehrle, 1958) the paucity of aquatic vegetation was noted as a characteristic of the flora of the eastern edge of the Allegheny Plateau in Central Pennsylvania. The waters of this area pass over and through strip mines and naturally exposed coal seams in their course to the streams forming the major pattern in the drainage basin of the West Branch of the Susquehanna River.

Leighton (1904) gave the following general description of streams polluted by acid mine drainage: "The appearance of a small stream into which coal-mine waters are discharged is peculiar. The bottom of the channel is colored a light yellow and there appear no signs of vegetation of any kind. All fish life in the stream is immediately destroyed at the first appearance of coal mine wastes." This description is incomplete only in omitting mention of the abundant mats of *Eleocharis acicularis* (L.) R. & S. in the more shallow portions of many such streams.

The records obtained by Love (1954) from the West Branch of the Susquehanna River, two miles downstream from Lock Haven (Clinton County, Pa.), are instructive in

demonstrating the pH conditions that prevail in the drainage basin under consideration. In 36 samples collected from this location between October, 1945 and September, 1950, the pH ranged from a low of 3.05 to a high of 4.6. Unpublished records of the Pennsylvania Fish Commission (Table I) illustrate the frequency of acid mine drainage and its effect on stream acidity.

Table I. The recorded pH of some of the streams of Clearfield County, Pa. Streams polluted with acid mine drainage are designated by the letters AMD following the pH value.

Stream	Tributary of	Date	pH
Mountain Run	Bennett's Branch	2- 5-58	5.0 AMD
Little Clearfield Creek	Clearfield Creek	3-21-56	7.2
Trout Run	W. Br. Susquehanna R.	3-21-56	6.8
Montgomery Run	Anderson Creek	5-17-56	4.4
W. Br. Susquehanna River	Susquehanna River	4-18-57	4.8 AMD
Sinnemahoning Cr. Bennett's Br.	Sinnemahoning Cr.	7-23-47	3.2 AMD
Cush Cushion Cr.	W. Br. Susquehanna R.	7-28-48	7.9
Deer Run	W. Br. Susquehanna R.	7-29-47	4.2 AMD
Horn Shanty Run	W. Br. Susquehanna R.	9- 5-51	6.3
LaBorde Run	Sandy Lick Creek	3- 5-57	4.6 AMD
Montgomery Cr.	W. Br. Susquehanna R.	9- 5-51	5.2 AMD
Little Muddy Cr.	Muddy Creek	7-25-47	3.0 AMD
Pine Creek	Clearfield Creek	9-25-56	5.8 AMD
Shryock Run	W. Br. Susquehanna R.	7-22-48	4.5 AMD

The data presented and the drainage conditions discussed in this paper account for: (1) the observation of a yellowish residue on rocks in many of the stream channels of the area, and (2) the rarity of aquatic vegetation. Only one aquatic species, *E. acicularis*, has been found to be present in most of these streams. It appears to thrive forming large, bright green, usually vegetative mats. In some cases the mats are extensive enough to form a semi-continuous cover over the stream bottom.

Other aquatics have not become established in the acid mine drainage of this area. The success of *E. acicularis* in such a situation is not alluded to in the habitat description "muddy shores" of Gleason (1952) or "damp shores and low grounds" of Fernald (1950). *E. acicularis* does occur in

damp to wet places as a semi-aquatic, but it also occurs as a true aquatic under the conditions described. —STATE UNIVERSITY COLLEGE OF EDUCATION AT GENESEO, N. Y.

LITERATURE CITED

EHRLE, ELWOOD B. (1958) The Flora of Clearfield County, Pennsylvania. Ph.D. Thesis, The Pennsylvania State University, (Unpublished)

FERNALD, M. L. (1950) Gray's Manual of Botany, 8th ed., p. 253.

GLEASON, H. A. (1952) The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada. Vol. 1, p. 263.

LEIGHTON, MARSHALL O. (1904) Quality of the Water in the Susquehanna River Drainage Basin, U. S. Geological Survey Water Supply Paper 108, p. 31.

LOVE, S. K. (1954) Quality of the Surface Waters of the United States —1950, I. North Atlantic Slope Basins, U. S. Geological Survey Water Supply Paper 1186, pp. 103-104.

UNPUBLISHED RECORDS — Pennsylvania Fish Commission, Bellefonte Office. By Permission.

REVISION OF HETEROTHECA, SECTION HETEROTHECA (COMPOSITAE)

BURDETTE L. WAGENKNECHT

(Concluded)

DISTRIBUTION AND HABITATS: Northwestern Arizona to Sonora and Chihuahua, Mexico and Great Bend National Park, Texas. Sandy soil along small occasional streams, roadside ditches, waste places, in valleys at altitudes of 1,000 to 4,500 feet.

This species is most closely related to *Heterotheca latifolia* Buckl., from which it differs in the more robust habit, the elongate peduncles and the more glandular phyllaries. Specimens placed in this species have at various times been identified as *H. inuloides*, *H. leptoglossa*, *H. grandiflora* and *H. subaxillaris* (sensu *H. latifolia*).

The specific epithet refers to the habitat preference of this species. Apparently undisturbed silt and gravel soils are not colonized by it.

Representative specimens. **Texas:** Brewster Co.: Santa Helena Canyon, Big Bend National Park, *Moore and Steyermark 3467* (GH, PH, UC). **Arizona:** Cochise Co.: 8 mi. e. Pearce, *Wagenknecht 4880* (KANU); Graham Co.: 16 mi. s. Safford, *Gould & Haskell 3984* (CU); Pima Co.: 8 mi. n. w. Tucson, *Wagenknecht 4849* (KANU); Pinal Co.: 3 mi. n. w. Coolidge, *Wiggins & Rollins 481* (NY); Yavapai Co.: 10 mi. s. Prescott, *Gillespie 8532* (GH, UC). MEXICO: **Chihuahua:** Chihuahua, *Pringle 674* (GH, NY, PH, US), Camargo, *White 2289* (GH).